

Summary of open-session discussion

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Updates to existing studies

- Combined fits of neutral and charge current can help constrain flavour separation and polarized PDFs:
 - [Eur. Phys. J. A \(2017\) 53](#) contains most of the information in the tables, but help from theorists is needed to implement this in something like ePump for assessment of impact on PDFs ([Phys. Rev. D 99, 054004 \(2019\)](#))
- Positrons and deuteron running present two ways of expanding beyond ep scattering.
 - The community should combine sufficient information about the tradeoffs between positron or deuteron running to allow for better planning.
- Lepton flavour violation using the $e^- \rightarrow \tau^-$ presents opportunities at integrated luminosities of 100 fb^{-1} or more
 - The one prong decay analysis chain must be developed for more detailed assessments. Such an analysis could allow for a study of lepton number violation in the $e^- \rightarrow \tau^+$ channel
- Additional work on polarized charged current cross-sections could bolster the case for positron beams (see <https://doi.org/10.1063/1.5040210> for details)
- Searches for dark photons at the EIC are in a kinematic region that will not be covered by other experimental results in the foreseeable future. The community believes that it will be worth the effort to pursue this further.

Potential new studies with Ion scattering (besides deuteron)

- Flavour decomposition could be obtained with SIDIS as well however potential systematics from hadronization or fragmentation functions make the interpretation more difficult
- For single or double spin asymmetries the first step is to determine if within the current expected running for gluon saturation we could get enough statistics to make these measurements worth-while
- Potential study: nuclear PDFs and nuclear effects in extractions of different observables (CSV, weak mixing angle)
- Potential study: EMC effect
- Potential study: extractions of weak mixing angle from mirror nuclei or super ratios of parity violating asymmetries for different systems

Potential new studies

- Investigation of sum rules could lead to potential checks on QCD
- While measurements of the V_{ud} CKM element is certainly not profitable for the EIC, the V_{us} or V_{uc} could provide sensitivities beyond what is going to be measured in the next decade
- Investigations of lepton number violation could provide constraints on specific models but getting a model independent measurement could be difficult
- It is well known that in the s-channel $e^- e^+$ polarized collisions the polarizations of the two beams add up to provide a higher sensitivity for a double spin asymmetry
 - It would be worth investigating which kind of observables would benefit from this type of addition in e-p collisions
- Charged current diffractive PDFs (see <https://arxiv.org/pdf/hep-ph/9803423.pdf> for details)